Improving Structural Integrity Monitoring (SIM) for Water Mains: Collaboration Efforts and Opportunities

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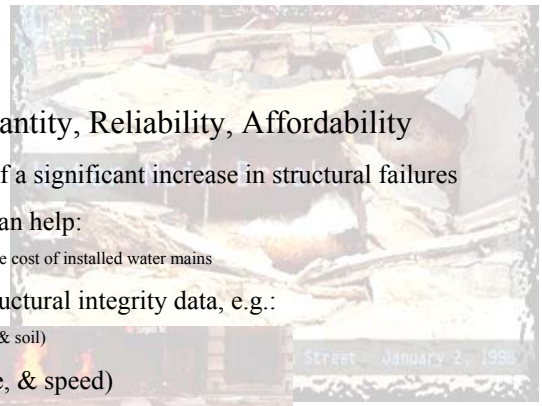
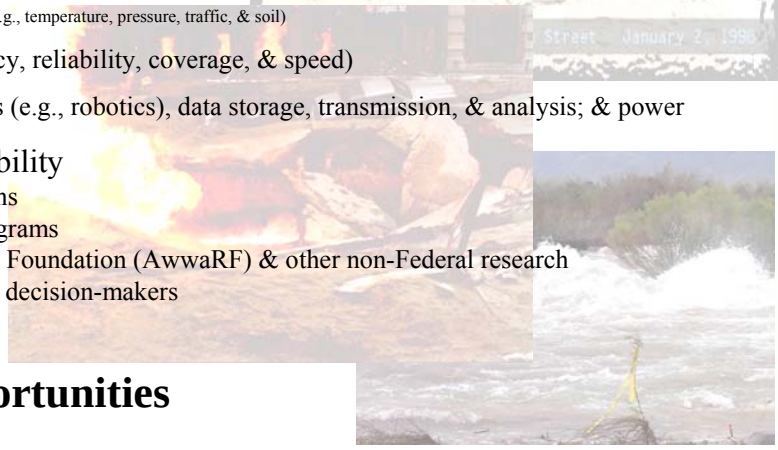


Issue and Resolution

- Water Main Breaks/Leaks Pose Risks to Drinking Water Quality, Quantity, Reliability, Affordability
  - High risk main breaks are of particular concern; U.S. mains may be on the verge of a significant increase in structural failures
  - Effective, proactive, condition-based repair, rehabilitation, and replacement (R^3) can help:
    - Minimize high risk water main structural failures and their adverse effects; Maximize service life & minimize life-cycle cost of installed water mains
  - Effective, proactive, condition-based R^3 relies on sufficient, accurate, & timely structural integrity data, e.g.:
    - Leakage, wall thinning, pitting, cracking, deformation, bending, movement, loading (e.g., temperature, pressure, traffic, & soil)
  - Existing SIM capability has many weaknesses (e.g., accuracy, reliability, coverage, & speed)
  - SIM can be improved, e.g.: better sensors, sensor platforms (e.g., robotics), data storage, transmission, & analysis; & power
- Accelerate and Expand Improvement of SIM capability
  - Identify users' key SIM improvement targets for water mains
  - Utilize SIM-relevant Federal research outputs/facilities/programs
  - Complement American Water Works Association Research Foundation (AwwaRF) & other non-Federal research
  - Publish SIM technology performance & cost data to inform decision-makers



EPA Collaboration Efforts and Opportunities

- EPA-AwwaRF Workshop: Next-Generation Inspection Technologies (7/05)
- Identification of Federal Research Potentially Transferable to Water Mains SIM (12/05)
  - Short-& long-term research, development, demonstration, & standardization
    - Integrity management of gas & hazardous liquid pipelines for on-shore & off-shore applications
    - In-line inspection, external inspection, above-ground surveys, research roadmaps
    - Sensors, sensor networks; remote sensing; non-destructive evaluation; materials
  - Potential key Federal collaborators: Departments of Defense, Energy, Transportation; National Institute of Standards and Technology; National Science Foundation; National Aeronautics and Space Administration

- Other EPA Options for SIM Research Collaboration
  - Small Business Innovation Research
  - Test facilities: Pipeline test apparatus, Edison, NJ #
  - Cooperative research & development agreements
  - Environmental Technology Verification
  - Distribution Simulator, Cincinnati, OH *
  - Economic assessments

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http://www.epa.gov/facilities_network/watershed.html

*http://www.epa.gov/facilities_network/testevaluation.html

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